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Date of request 10/12/95 Expected receipt of document 1 MONTH

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Cascade Operations Weekly Report - Process Division

(This section to be completed by Document Center)

Date request received 10/30/95

Date submitted to ADC 11/2/95

Date submitted to HSA Coordinator 10/30/95

(This section to be completed by HSA Coordinator)

Date submitted to CICO 11/2/95 1/18/96

Date received from CICO 12/18/95 3/12/96

Date submitted to ChemRisk/Shonka and DOE 3/13/96

(This section to be completed by ChemRisk/Shonka Research Associates, Inc.)

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**SANITIZED VERSION OF CASCADE OPERATIONS WEEKLY REPORT DATED 1/3/49**

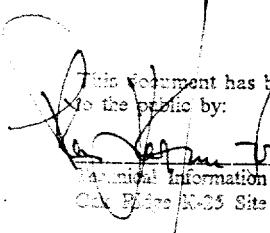
**(SANITIZED VERSION OF UNNUMBERED CRD DOCUMENT)**

Compiled by  
S. G. Thornton  
Environmental Management Division  
OAK RIDGE K-25 SITE  
for the Health Studies Agreement

January 18, 1996

Oak Ridge K-25 Site  
Oak Ridge, Tennessee 37831-7314  
managed by  
LOCKHEED MARTIN ENERGY SYSTEMS, INC.  
for the U.S. DEPARTMENT OF ENERGY  
under Contract DE-AC05-84OR21400

This document has been approved for release  
to the public by:

 A.S. Gust  
Technical Information Officer Date 4/19/96  
Oak Ridge K-25 Site

January 3, 1949

CARBIDE AND CARBON CHEMICALS CORPORATION

PROCESS DIVISION

CASCADE OPERATIONS WEEKLY REPORT

J. A. Marshall

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File (2)

~~CONFIDENTIAL~~  
Classification changed to: ~~CONFIDENTIAL~~  
(level and category)  
~~None~~ (if applicable) ~~12/17/48~~  
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To: Mr. J. P. Murray  
Location:

Date: January 3, 1949

Copy To: Attached Distribution

Subject: Cascade Operations  
Weekly Report, Ending  
0800, 1/3/49

### SUMMARY

Product withdrawn was .049% below the previous week. Product purities for the week ending 12/27/48 was 95.88%. Net input from crude feed and PDF was down .032% from the previous week. Recovered feed charged back to the cascade contributed an additional .228 kilograms of X.

The cascade onstream efficiency was 99.73%. This low onstream efficiency was due to a power failure at 6:35 p.m. on December 29, 1948 and the subsequent offstream time taken to repair equipment failure attributed to the power failure. This power failure was one of the most serious from an equipment standpoint of recent experience. To date twenty-one seals, five pumps and two motors have failed due to this power failure and have been replaced. Additional equipment may fail in the near future according to present indications.

This is borne out by the fact that cells in K-310 and K-311 were manually tripped whereas cells in K-303, K-304 and K-305 for the most part, tripped later at the bus in the Power House. Area II has some seals which look bad but do not require replacements at this time.

The converter replacement program was approximately 52% complete as of 12/30/48. The installation of 126 stages of size two converters is complete. Of the 996 stages of size three and 576 stages of size four scheduled for replacement, 576 of size three and 174 of size four have been completed.

The inside row of coolant tubes of all stages of cells 2 and 4 in K-301-1 was plugged. This completes the program of tube plugging in all K-309 and K-301 buildings.

The cascade efficiency was 97.91% for twelve glass tube racks and 97.26% for twenty-two metal tube racks. The overall efficiency for these thirty-four tube racks was 96.31%.

Four VF transformers were removed from service for replacement of core and yoke bolt insulation and four VF transformers were re-installed to service after replacement of core and yoke bolt insulation. As of 8:00 a.m., January 3, 1949 the transformer reinstallation program was 86% complete.

AREA II - A. D. Reeder

The cell onstream efficiency for the area was 99.43%. The onstream efficiency for three glass tube racks was 96.91% and the onstream efficiency for two metal tube racks was 91.92%.

On 12/29/48 at 6:17 p.m., K-310-1, K-310-2, K-310-3 and K-311-1 buildings were down due to VF failure. Power was restored at 6:32 p.m. and the cascade was back to normal in all buildings at 7:05 p.m.

K-310-2, cell 6 was offstream for 21 hours to change the 3B seal. The excessive offstream time on this cell resulted when the BOP released while Maintenance was pulling the seal. The cell had to be purged to a negative to complete the seal change.

K-309-2, cell 4 was offstream one-half hour to repair a stuck control valve.

K-301-1, cell 4 was offstream 9.25 hours to plug the coolant tubes in all stages.

K-301-1, cell 2 was offstream 7.67 hours to plug the coolant tubes in all stages.

K-101 was offstream all week. Maintenance work was finished on the pumps. Work on the rotometer is still incomplete and some work remains to be done on the mercoïd controlled line heating station.

No equipment failures in this area resulted from the power failure of December 29, 1948. However, high seal exhaust pressure in K-310-3 indicates some damage was done to atmospheric seals in that building.

On the theory that too many dead-end lines may have caused some of our sampling difficulties at K-311-1 the old line stubs to "Little Gene" and the Field Laboratory have been cut off and reblanked inside the manifold housing of K-311-1 Line Recorder

Covers had to be installed this week on the building ventilating screens when the dead-end water lines began to freeze in the basement.

Feeding of low concentration material into K-311-1 was complete on December 27, 1948.

The tie-in from building lube header to kinney pumps was completed this week.

Several coolant leaks to atmosphere were found and repaired during the week.

Cell breaker trip bulls-eyes in the area vaults were painted with luminous paint.

Use of the sectional recycle line for PDF has made it impossible to purge K-601 for the dismantling program. We had planned to use a section of the C-216 disposal header for this purpose. During the week the C-216 disposal header was valved off at K-302-4 and we tied the lower section into the K-27 purge line. Some place in the system there is a leak to atmosphere which we have not yet been able to locate.

Since it would be advantageous for K-27 to condense waste at continuous maximum pump suction pressure, a test was run in this area to determine the effect of higher pressures on the K-311-1 intersectional cell pumps. It was found that up to about discharge pressure the K-311-1 pumps can take it. Above this pressure our cooling system is inadequate. Since K-631 pressures normally used during the night give us discharge, it will be satisfactory to stop condensing rather than the usual in K-631.

#### AREA III - M. P. Seyfried

Cell onstream efficiency for the area was 99.74%. The onstream efficiency for three high sensitivity glass racks was 97.26%, onstream efficiency for one low sensitivity rack was 99.26% and onstream efficiency for one metal rack was 98.41%.

K-302-3, cell 5 was off 5.05 hours to change the 5A seal.

K-302-5, cell 5 was off 8.04 hours to change the 4B seal.

K-303-1, all cells were down nine hours (one hour each) due to the power failure of 12/29/48. In addition to this the 5B seal of cell 6 and the 6A seal of cell 7 failed with 6.50 and 7.15 hours respectively offstream time.

All coolant heads and flanges in cell enclosures of Area III have been tightened. All enclosures were checked for alpha contamination and O<sub>2</sub> deficiency. Twenty six coolant leaks were found and repaired.

The job of installing solenoid valve on A-1 CO<sub>2</sub> compressor was not satisfactory on test run and changes are being made.

K-302-5 cold traps and purge and product cold traps operated 115 hours during the week. (96 and 19 respectively). No PG was returned to the cascade. Daily average CO<sub>2</sub> consumption was 113 pounds. This heavy consumption was due to starting up the Purge and Product room.

AREA IV - L. L. Anthony

Cell onstream efficiency was 98.24%. The onstream efficiency for the one glass rack was 100%, and the onstream efficiency for three metal racks was 93.50%.

During the week the K-310-3 line recorder manifold was altered and a metal tube rack, not yet accepted, was installed.

K-303-4, cell 7 was offstream .33 hour for an inleakage check.

K-303-2, cell 5 was offstream 16.50 hours to change two seals.

K-303-3, cell 3 was offstream 29.25 hours to change five seals.

K-303-4, cell 7 was offstream 27.08 hours to change one seal and one pump.

K-303-4, cell 9 was offstream 22.83 hours to change one seal.

K-303-9, cell 2 was offstream 61.03 hours to change eight seals and one pump.

At 6:18 p.m. on 12/29/48 the No. 8 generator at the Power House failed and in trying to adjust the load on the remaining generators on the blue network, a large voltage sag resulted. This low voltage caused the stage motors to turn over very slowly and after twenty minutes the power to the blue network was completely cut off at 6:38 p.m. The power was restored at 6:45 p.m. and by 7:40 p.m. all cells were onstream except for a few where the cell motor breakers would not stay in. Almost all of the 245.55 cell offstream hours for the week can be charged directly or indirectly to the power disturbance. A total of fifteen seals and three pumps were changed following the power disturbance. Two of the pump changes resulted because of shaft damage when the seals were burned out.

AREA V - K. M. Jones

Cell onstream efficiency was 99.10%. Onstream efficiency was 95.45% for five metal racks.

K-304-5, cell 5 was offstream 5.35 hours to replace the 5B seal.

K-305-4, cell 7 was offstream .25 hours and K-305-5, cell 2 .20 hours for inleakage checks.

A VF failure occurred at 6:34 p.m. on 12/29/48. All Area V buildings were placed on inverse recycle until 6:47 p.m. when power was restored. The cascade was rejoined and conditions restored to normal by 8:35 p.m. This power failure accounted for 97 hours of offstream time in this area.

Twelve hours and twenty-five minutes offstream time is chargeable to cell 2, K-305-5 to change the 4A, 5B and 6B seals.

Seven hours and twenty-five minutes offstream time is chargeable to cell 7, K-305-4 to change the 2B seal and the 3A gaskets.

Twenty-three hours offstream time is chargeable to cell 3, K-305-5 for replacement of the 6B pump and motor and the 5B seal. Offstream time was high for this cell due to the fact that no purging could be done from 7:50 a.m., 12/31/48 until completion of the plant inventory. A special procedure was used in conditioning this cell as follows:

AREA VI - W. C. Hartman

Cell onstream efficiency for the area was 99.39%. Cell efficiency does not take into consideration the lost time due to the power failure which was an average of about 18 minutes per cell. Onstream efficiency for three glass racks was 99.06% and onstream efficiency for two metal tube racks was 96.08%.

K-305-6, cell 2 was offstream 2.50 hours in preparation for the scheduled converter change.

Converters  
cells 1, 3 and 5. were installed in K-305-11

Coolant tie-ins were completed in cells 1-3 and 5-7 in K-305-11. K-305-11 is now complete with tie-ins. coolant

The 4B pump in K-305-7, cell 1 started to rub about one-half hour after the cell was started after the power failure. The cell was purged and the pump changed.

Lube oil in basement dripping drums was pumped back into the lube system prior to the lube oil inventory.



AREA VII - J. O. Deming

Cell onstream efficiency for the area was 99.90%. Onstream efficiency for one metal rack was 96.22% and the onstream efficiency for four metal racks was 96.86%.

The glass tube racks in K-312-2 were out of service all week while the manifold was being converted for metal tube rack installation.

K-306-7, cell 5 was offstream 2.45 hours to replace the 3A motor which had burned out.

Cell 3, K-312-1 continued on test conditioning run. Results of last week's samples were C-216 - 26.9% and C-616 - 1.10%.

K-312-1 operated all week as tops purge building with an average concentration of .000073 mol %. K-312-2 operated all week as side purge building with an average concentration of nil. Purge rate for the week was 41,944 standard cubic feet and the daily average was 5,992 standard cubic feet.

No 2144 was on hand on 12/28/48. During the week 67 pounds were received and 28 pounds were used. On hand 1/3/49. 39 pounds.

ELECTRICAL SYSTEMS OPERATIONS - C. E. Jones

Four VF transformers (7-V3B-211, 7-V6B-215, 7-V5B-212, 7-V7A-216) were removed from service for replacement of core and yoke bolt insulation. Four VF transformers (7-V3B-211, 7-V6B-215, 7-V5B-212, 7-V7A-216) were restored to service after replacement of core and yoke bolt insulation.

To date, ninety-four (94) 500 KVA transformers, fifty-seven (57) 600 KVA transformers and forty-two (42) 800 KVA transformers have been completed. The program is 86% complete.

Feeders 305 and 317 were restored to service after a series of dielectric absorption tests were made on the feeder cables.

Feeders 282, 284, 285, 286 (Bus 2) VF supply to K-304 section; feeders 271, 272, 273, 274, 275 (Bus 1) VF supply to K-305 section; feeders 242, 244, 245, 246 (Bus 7 and 8) VF supply to K-310-311 section and feeders 201, 202, 203, 204, 205, 206, 207, 208. (Bus 3) VF supply to K-303 section were deenergized during the report period due to power failure at K-25 Switch House.

At the time of the failure generators 4, 5, 8 and 10 were paralleled on the blue network supplying power to K-303, K-304, K-305 and K-310-311 sections at 65 cycles. Generator 8 tripped due to low vacuum. This shifted a load of approximately 77.5 mw

to generators 4, 5 and 10. Frequency dropped from 65 cycles to 60.4 cycles and the voltage dropped from 14.9 KV to 14.1 KV. Load seemed to level out at this point for approximately one minute. However, due to the sudden heavy load on the machines and the large internal voltage drop in the generators resulted in field saturation. With the machines loaded with high reactive and unbalanced load caused voltage to start dropping again and while attempting to correct this the voltage dropped to 4000 volts which resulted in tripping out manually the above feeders.

Lighting for the K-1037 building has been changed from the 2400 volt fence lighting circuit to the 3-200 KVA transformer bank supplied by CF feeder 302. The fence lighting circuit will now serve as an emergency supply for lighting to this building through a double throw switch.

Work is complete on dismanteling the 13.8 KV overhead line No. 2.

The 2400 volt fence lighting circuit was out of service for a short while due to a primary fuse blown on No. 1 constant current regulator.

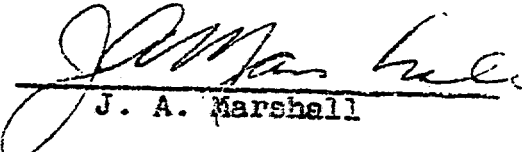
Service was disconnected from several dwelling houses in the Wheat Colony Area which were supplied from the 13.8 KV overhead line No. 1.

A work order was issued to remove a lateral off the 13.8 KV overhead line No.1 which formerly supplied lighting for the J.A. Jones storage yard. Poles, lines and equipment will be removed and all salvable material returned to stores.

POWER LOADS (FW)

<u>DATE</u>	<u>TIME</u>	<u>VF-K-25</u>	<u>HF-K-25</u>	<u>CF-K-25</u>	<u>CF-K-27</u>
12/28/48	0700				
12/29/48	0700				
12/30/48	0700				
12/31/48	0700				
1/1/49	0700				
1/2/49	0700				
1/3/49	0700				

Average Load

  
J. A. Marshall

## DISTRIBUTION

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TIMOTHY BENNETT 1 1034A  
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Date of request 10/12/95 Expected receipt of document 1 MONTH

Document number \_\_\_\_\_ Date of document 1949

Title and author (if document is unnumbered) K/EA-368 Cascade Operations Dept  
Weekly Progress Report Wending  
Compilation of process/production information 5/30/49  
(This request was for 3 separate docs. - 2 Unc. + 1 Classified)  
Please copy only the marked pages

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Date request received 10/30/95

Date submitted to ADC 11/2/95

Date submitted to HSA Coordinator 10/30/95

(This section to be completed by HSA Coordinator)

Date submitted to CICO 11/2/95 1/18/96

Date received from CICO 12/18/95 3/12/95

Date submitted to ChemRisk/Shonka and DOE 3/13/96

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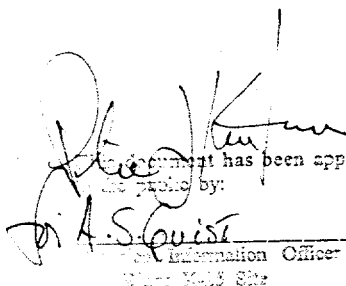
**SANITIZED VERSION OF CASCADE OPERATIONS WEEKLY PROGRESS REPORT  
FOR WEEK ENDING 5/30/49**

**(SANITIZED VERSION OF UNNUMBERED CRD DOCUMENT)**

Compiled by  
S. G. Thornton  
Environmental Management Division  
OAK RIDGE K-25 SITE  
for the Health Studies Agreement

January 18, 1996

Oak Ridge K-25 Site  
Oak Ridge, Tennessee 37831-7314  
managed by  
LOCKHEED MARTIN ENERGY SYSTEMS, INC.  
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under Contract DE-AC05-84OR21400

  
This document has been approved for release  
by: J. A. Swist  
Information Officer  
Oak Ridge Site  
Date: 4/11/96

Date of issue: June 3, 1949

CARBIDE AND CARBON CHEMICALS CORPORATION

Process Division

Cascade Operations Department

Weekly Progress Report  
For Week Ending May 30, 1949

M. F. Schwenn

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Willson, L. C. (2)

Classification changed to

**CONFIDENTIAL**

Class and category

Signature of AD or AD's signature first reviewer

Date

AD's signature final reviewer

Date

# CASCADE OPERATIONS DEPARTMENT

Weekly Progress Report  
0800 May 23, 1949 to 0800 May 30, 1949

## CASCADE SUMMARY

Product withdrawal was 8.37% below the previous week (not corrected for purity). Average product purity for the week ending 5-23-49 was 97.50%. Net input to the cascade from crude and PDF was 1.75% below the previous week. Recovered material fed to the cascade contributed an additional net input of zero kilograms of "X". The crude feed balance for the year to date is 826.69 pounds overfed.

## On-stream Efficiency

<u>Area</u>	<u>Number of Operating Cells</u>	<u>Operating Cell Efficiency</u>	<u>Number of Metal LR Tube Racks</u>	<u>LR Efficiency</u>
I	90	99.69	5	97.21
II	53	99.42	4	96.13
III	84	99.96	5	97.36
IV	83	99.99	5	98.02
V	97	99.75	5	98.10
VI	82	99.96	5	98.87
VII	83	99.61	5	97.36
	572	99.78	34	97.55

## Power Loads (MW)

<u>Date</u>	<u>Time</u>	<u>VF-K-25</u>	<u>HF-K-25</u>	<u>CF-K-25</u>	<u>CF-K-27</u>
5-24-49	0700				
5-25-49	0700				
5-26-49	0700				
5-27-49	0700				
5-28-49	0700				
5-29-49	0700				
5-30-49	0700				

Average load

Average distribution of K-25 CF Load was metered as follows:

1. Station Service
2. I-10 (Feeder 319)
3. S-50 (Feeder 320)
4. Overhead (Feeders 308 and 309)

5. Utility (Feeders 301, 303, 311, 313)
6. Administration and Service Area (Feeders 302, 312)
7. K-1037 (Feeder 302)
8. Process Area

Total

K-29 - E. O. Sternberg

Design and Construction:

Recommendations were made to Engineering Design and Development for the following:

1. Direct Recycle Control - It was requested that the control be designed as a low pressure actuated control. If 'A' suction pressure dropped below some predetermined pressure, a pressure switch would open the recycle valve. Closure of the valve would be a manual operation at the cell location.
2. Cell Motor Operated Valve Controls - It was recommended that at each cell panel there be (a) an individual control switch for each valve, (b) a 'master in - out' selector switch for each valve a control, (c) a 'master in - out' selector switch for each cell. At the control room (c) would be duplicated. These would be coupled with indicating lights to indicate cell on or off stream. Cost data for additional controls in the control room were requested. These controls to provide selection from control room for cell by-pass valve operation.
3. Floor Drains - It was suggested that floor drain facilities to provide cooling water drainage for vacuum test pumps on cell floor and provide drainage for possible seepage at basement floor level
4. Recycle Lines on Axial Booster Pumps - No provision was made for providing recycle flow to suction of axial booster pumps on the Architect - Engineer process piping prints. It was suggested that a recycle line be provided equipped with the control mentioned in (1) above to protect these compressors when the normal 'A' suction flow is cut off. The recycle line will be tied to the discharge of a centrifugal pump which is in series with the axial pump.

Meetings were attended in which the maintenance (disassembly, reassembly, etc.) of the prototype and production model axial compressor were discussed with Carrier representatives. Cleaning, welding, and vacuum test information in use at K-25 was relayed to the Carrier people at that time.

A meeting on converter construction was attended in which relative costs and merits of aluminum and nickel plate steel construction were discussed. Although costs of aluminum construction were somewhat lower than steel, it was felt that installation, maintenance, and operating problems with aluminum would outweigh that cost advantage and the aluminum construction was discarded.



## Test Loop:

Construction work on the test loop continued with:

1. Installation of a four inch water supply header from the basement to the cell floor freon condensor.
2. Installation of a valve on the K-309-3 north side building return header to be used as a connection for the freon condensor cooling water return header.
3. Installation of conduit for power supply wiring from pole #357 to the switchgear in K-309-3.

## AREA I - L. C. Willson

The motor cleaning program for 150 h.p. motors was completed in K-402-2 during the week at the rate of 2 cells per day. The motors of K-402-2 cell 1 were not cleaned as they were previously replaced. No motors were replaced on Thursday as maintenance was occupied in K-25.

The total offstream time was 42.83 hours for cleaning the motors of the eight cells. Cost of the motor cleaning program during the week was \$1,175.63. The total cost to date has been \$10,936.97.

The following data present the cost breakdown:

<u>Building</u>	<u>Total Labor and Material</u>	<u>Average Off-stream Time/cell</u>	<u>Unit Cost Per Motor</u>		
			<u>Elect. Maint.</u>	<u>Mech. Maint.</u>	
			<u>Field</u>	<u>Shop</u>	
K-402-9	\$ 1,648.72	5.47	8.27	4.01	6.55
K-402-8	1,513.24	5.23	6.74	4.38	6.35
K-402-7	1,456.09	4.91	8.96	5.10	5.97
K-402-5	1,474.15	4.87	6.13	5.07	6.13
K-402-4	1,349.49	4.71	7.39	1.73	6.53
K-402-3	2,319.65	5.45	12.84	9.27	9.16
K-402-2	1,175.63 *	5.35	6.03	5.01	5.52

\* This covered only 8 cells.

Average building cost - \$1,562.42.

A total of 32 seal gaskets and 9 seals was replaced and one coolant pump was repaired in K-402-2 during the motor cleaning program.

The temperatures of all motors of two cells in each building were taken Using K-402-8 as a typical building, the average temperatures based on 100° F. ambient were as follows:

Withdrawal Alley Motors  
'B' Motors                      'A' Motors

Escape Alley Motors  
'B' Motors                      'A' Motors

In order to reduce the temperature of AC motor feed cables, the junction box covers in the basement are being replaced with screens to provide better ventilation through the conduits.

The orifices in the air ducts to withdrawal alleys are being removed to increase the flow of air as the motors in the escape alleys are operating much cooler than those in the withdrawal alleys.

Micromaxes are being installed on motors of 5 cells within the area to observe the temperature rise of the motors as the outside ambient temperature becomes warmer.

The 3B motor that was removed from cell 9 of K-402-3 was checked in the electrical maintenance shop and no trouble was found in the motor. The motor was cleaned again and installed in K-402-2, cell 4, 3B position. The motor continued to operate at an excessive temperature. It will be removed again and sent to the shop for engineering tests and rewinding.

While cell 2, K-402-2 was down for the motor cleaning program, attempts were made to actuate the BOP of the 2A pump without success. The BOP line apparently is plugged at the point of connection to the pump. However, the scheduled seal work was postponed until some future repair work requires purging.

Two Kinney pumps failed during the week. SV-2 in K-402-7 froze in operation due to plugged oil lines. This pump was installed with clean lines on 2-23-49. SV-1 in K-402-8 was shut down for inspection and froze while down. A check of oil lines a few minutes prior to this pump being shut down indicated a sufficient flow of oil to both bearings. However, a check in the Vacuum pump shop showed the bearing in the closed end of the pump to be frozen.

<u>Material</u>	<u>Period Covered</u>	<u>Total Units</u>	<u>Daily Average</u>
Crude Feed	May 19 to May 25	857.32	122.47
PDF	"	572.30	81.75
Waste	"	1386.76	198.11

An additional check scan was made of 'F' surge drum in K-631 by use of the K-402-2 line recorder. This was made by running a continuous scan while the drum was being evacuated. The percent of lights remained constant during the entire time of evacuation. The test showed no stratification of lights within the surge drum.

AREA II - A. D. Reeder

The BOP on the 2A pump of K-310-3 cell 3 deactuated and the cell pressure

rose                      It was felt that a large part of the                      was  
wet air and the cell was given a drying shot of                      After con-  
ditioning, a seal check was run and the 3A and 4B seals were bad. However,  
the BOP would not hold on the 4B and the cell was purged to a negative and the  
two seals changed. One galled seal nut was experienced where the shaft had  
to be dressed down and threads re-run.

Temporary capacitor units of 120 KVAR each were installed on the load  
side of the cell 2 'B' motor breaker in K-309-2 and on a spare breaker on the  
same transformer on 5-26-49. While the cell was down for this installation,  
all 'A' and 'B' motors were cleaned in the shop and then replaced in the  
original positions. Temperature and load tests are in progress at high side  
pressures. Transformer tap settings have been raised to give  
voltage at  $2\frac{1}{2}\%$  above the former level ( $5\%$  above midpoint) to reduce the motor  
ampere loads. The capacitor units to improve the power factor for generation  
plus the transformer tap changes to reduce motor loads are being tested at this  
cell in preparation for similar changes in all cells of the 309 and 301 sections  
in order to operate at higher pressures in these sections.

Development work is in progress by Engineering and Maintenance on a new  
type expansion joint for the aluminum interplant housing. An experimental  
installation will be ready early next week.

The water extraction apparatus for recovering C-616 and C-816 from K-101  
product has been assembled except for the emergency exhaust system.

Ten and eighty-five one-hundredths pounds of FW test material from K-311-1  
cell 8 were sent to Y-12 on 5-23-49.

On 5-24-49 a series of four 24 hour runs was started using the new tri-  
chloroethylene-freon refrigeration system and double cylinder unit. The first  
three runs ran less than 12 pounds of material. After recalibration of instru-  
ments and installation of a needle valve in the G-74 bleed line, the final run  
ran twenty pounds and 5 ounces of material in a 24 hour period. This was with  
a  $20\%$  G-74 bleed into the material before the cylinder valve.

#### AREA III - M. P. Seyfried

Experiments in lighting arrangement continue. Several banks of lights  
may be turned off in the front and back of the operating floor, especially  
during day light hours. Double sockets were replaced with single bulbs in the  
front and back stairwells, saving 1400 watts per building. With the improved  
coverage of bulb replacements, the double sockets are being removed in all  
cascade buildings.

The cold trap operated 64 hours during the week. No material was re-  
turned to the cascade.

#### AREA IV - D. G. Crecelius

The cleaning of the four K-303-10 surge drums was completed. The bull  
noses were welded on, the drums pressure tested, conditioned, and returned

to the surge system. A total of 1,099.7 grams of material was removed. The 5# G-74 used for pressure testing was bled to the atmosphere through a paper filter bag and discs of filter paper placed over the C-216 charging flange. Some material was retained on the filter paper. Airborne alpha checks indicated that no above tolerance values could be obtained through the filters.

The K-303-9 Freon 113 test cell was offstream to check for inleakage in an attempt to locate Freon leakage to the cascade.

A series of tests is being run with and without air to the packing glands of the coolant pumps in K-303-2. Present information indicates that there is no leakage with air on these glands.

The exhaust line from the emergency gas engine in K-303-8 is being shortened to eliminate the possibility of water condensing in the line.

#### AREA V - K. M. Jones

A special test is in progress in K-305-2 to determine if a heavier oil will give more satisfactory service in the basement ventilating fan bearings. The oil normally used in these bearings is an SAE 30 oil. All fan bearings in K-305-2 have been filled with a 90 weight gear case oil which has given very satisfactory results during the two weeks that it has been in use. There are no indications that this heavier oil is being drawn past the bearing seal and into the blower as is the case with the lighter oil.

A special test started on March 15th to determine the possibility of eliminating the cell seal exhaust Moore valve in K-29 was discontinued. For the purpose of the test, the Moore regulator was valved off from the system and the cell seal exhaust pressure maintained at the correct value by manually adjusting the cell seal exhaust by-pass valve. It was found that satisfactory pressure control could be achieved with one or two adjustments to the by-pass valve per 24 hour period.

In order to reduce the load to the Kinney pumps, a total of 25 atmospheric seal gaskets was changed in cells 7, 9, and 10 in K-304-3 which resulted in the reduction of building seal exhaust header pressure.

The work accounted for 39.8 cell offstream hours.

The SV-1 Kinney pump in K-304-5 failed when the solenoid valve, on the special 'always safe' reservoir system became plugged.

It was necessary to replace one tube rack because of a plugged chem trap.

#### AREA VI - W. C. Hartman

The K-305-12 manifold was converted and a metal tube rack installed in place of the glass rack.

A tube rack with an automatic pirani control was placed in K-306-1 and has been performing satisfactorily.

Three Kinney pumps had been installed with  $\frac{1}{2}$ " oil lines from the reservoirs to the pump. An inspection of two of these lines revealed the start of a build-up of solids at the fittings. These pumps have been in service for about six weeks.

SV-3 motor in K-305-7 caught fire and was replaced. The fire was caused by a failed load bearing on the motor.

A total of 821 below tolerance final hand counts was logged in the RR Area.

There were 268 visitors to the R area and 319 visitors to the RR area.

#### AREA VII - J. O. Deming

K-312-1 operated all week as the tops purge building with an average concentration of .000016 mol %.

K-312-2 operated all week as the side purge building with an average concentration being nil. The total purge for the week was 28,700 scf with a daily purge rate average of 4,100 scf/d.

The converter change program continues throughout the week. Converters were replaced in K-306-5, cells 1, 3, and 4 and K-306-4 cells 2 and 4. The motors of the above cells were replaced during the converter change.

The coolant systems of K-306-4 cells 2 and 4 were tied together.

K-312-1 cell 2 was put on stream during the week. An attempt was made to operate stage 2

The cell operated satisfactorily at these pressures over the week end.

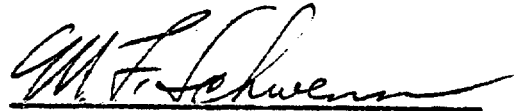
Work on installation of the new stairway to the RR Area at K-306-7 continued throughout the week and is complete except for the hole to be cut in the operating floor. This should be completed the early part of this week.

Several upflow scans were run in K-306-2, 3, 4, and 5 over the week end. The results of these scans are now being compiled.

#### ELECTRICAL SYSTEM OPERATIONS - C. E. Jones

An additional bank of transformers was installed this week for power and lighting supply to the new garage (K-1414). This garage will be operated by the contractor for construction of K-29. Supply for this bank of transformers is fed from the 2400 volt overhead circuit which is normally supplied by Feeder 602. The connection to this feeder was made at pole 58, near building K-1004-D. This bank of transformers which is located on the hill back of the main fire hall consists of 3-25 KVA, single phase, 2400/120/208 volt transformers and 3-25 KVA, single phase, 2400/460 volt transformers.

Transformers 3-V1B-221, 3-V2B-222, and 3-V2A-224 were out of service during the week to change transformer taps in preparation for the capacitors to be installed on the 'B' motors in the K-309-301 section. The transformer taps were raised from 2 $\frac{1}{2}$ % to 5%, thus raising the secondary voltage from 463 volts to 473 volts. At the end of the report period, transformer 3-V1B-221 is out of service for test purposes on this network.



M. F. Schwenn

/mew

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TIMOTHY BENNETT / 1034A

Requestor

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Date of request 10/12/95 Expected receipt of document 1 MONTH

Document number \_\_\_\_\_ Date of document 12/6/48

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Cascade Operations Weekly Report - Process Division J.A. Marshall

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Date request received 10/30/95

Date submitted to ADC 11/2/95

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K/EM-367

SANITIZED VERSION OF CASCADE OPERATIONS WEEKLY REPORT DATED 12/6/48

(SANITIZED VERSION OF UNNUMBERED CRD DOCUMENT)

Compiled by  
S. G. Thornton  
Environmental Management Division  
OAK RIDGE K-25 SITE  
for the Health Studies Agreement

January 18, 1996

Oak Ridge K-25 Site  
Oak Ridge, Tennessee 37831-7314  
managed by  
LOCKHEED MARTIN ENERGY SYSTEMS, INC.  
for the U.S. DEPARTMENT OF ENERGY  
under Contract DE-AC05-84OR21400

This document has been approved for release  
to the public by:

*[Signature]*  
Technical Information Officer  
Oak Ridge K-25 Site

*4 MAR 96*  
Date

December 6, 1948

CARBIDE AND CARBON CHEMICALS CORPORATION

PROCESS DIVISION

CASCADE OPERATIONS WEEKLY REPORT

J. A. Marshall

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Classification changed to: **CONFIDENTIAL**  
(level and category)  
*Robert W. Kelly* 12/17/48  
ADD signature (initial reviewer) *W. C. Hartman*  
ADD signature (final reviewer) \_\_\_\_\_

TO: Mr. J. P. Murray  
LOCATION: K-303-7

DATE: December 6, 1948

ATTENTION  
COPY: Attached Distribution

SUBJECT: Cascade Operations  
Weekly Report, Ending  
0800, 12/6/48.

### SUMMARY

Product withdrawn for the week was 1.19% below that of last week. The X input to the cascade for the week was 3.92% better than the previous week, all of which was derived from crude feed and PEF. Recovered material fed into the cascade during the week contributed an additional input of 0.162 kilograms of X.

Cascade cell onstream efficiency was 99.64% for the week as compared to 99.50% for last week. This week's low onstream efficiency is due a large extent to a power failure on bus No. 2 which occurred on December 1, at 5:10 a.m. This failure caused 169.35 cell hours offstream in the K-304 Section.

Frequency reductions on all variable frequency net works, except bus No. 6, were necessary as a result of No. 1 boiler failure and the bus No. 2 outage.

barrier was installed in K-305-4.1, K-305-3.2 and K-305-3.4.

Two-cell coolant tie-ins were made in four cells in Area V and sixteen cells in Area VII.

A C-816 leak developed on 12/3/48 in cell 6, building K-301-1 allowing approximately sixty pounds of C-816 to go into the cascade. The cell was down twenty-one hours and fifty minutes to plug inside row of coolant tubes. Considerable C-816 went up the cascade and some difficulties are anticipated with product withdrawn due to this material.

The inside row of coolant tubes were plugged in four cells during the past week.

The Plant "T" and "X" Inventory was taken at 1300 on 11/30/48. Also the Monthly Coolant and Lube Inventories were taken in all buildings on 12/1/48 at 0700.

AREA I - L. C. Willson

Cell onstream efficiency in this area for the past week was 99.91%. Line Recorder efficiency was 97.88% for the week.

Twelve hours and forty-five minutes offstream time is chargeable to cell 1, K-402-4 to change a 3B seal. At the time this cell was shut down for the seal change, all B motors were replaced in order to substitute motors which have had the wind deflectors removed.

Line Recorder Station K-402-1 has been completely stripped according to new design on 12-3-48.

Work is continuing in the preparation of K-131 for operation without the use of carbon traps. Engineering check prints have been submitted for approval in the past week.

The cascade was underfed .044 units for the month ending 11/30/48 as compared to 29.52 units overfed for the year to date.

Production

K-131 Building

Total crude feed from 11/25/48 to 12/1/48-----	821.54 units
Daily average crude feed from 11/25/48 to 12/1/48-----	117.33 units
Total PDF from 11/25/48 to 12/1/48-----	105.88 units

K-631 Building

Total waste from 11/25/48 to 12/1/48-----	921.58 units
Daily average waste from 11/25/48 to 12/1/48-----	135.65 units

AREA II - A. D. Reeder

This area had five buildings 100% onstream. Line Recorder efficiency, high sensitivity racks 99.26% - metal racks 92.06%.

The inside row of coolant tubes were plugged on all converters on cells 5 and 6 in K-309-3 and cell 6 of K-301-1.

Cell 8, in K-301-1 was offstream thirty-eight hours and forty-one minutes in order to change the 6B pump. The extended offstream time on this cell is due to the fact that Maintenance had a number of other high priority jobs.

Cell 6, in K-301-1 developed a C-816 leak and allowed approximately sixty pounds of C-816 to leak into the cascade. This cell was offstream twenty-one hours and ten minutes.

K-101

After K-101 was shutdown 11/24/48, no purging could be done for a period of several days because the surge for purge system was tied up. Finally on December 1, the pump was purged to a

negative and the "W" pump was removed to the Vacuum Pump Shop for a thorough overhaul job. Clearances on this pump have gradually been getting worse and the flow and been reduced to about 50% of the flow after original installation. Several minor repair jobs on equipment in the K-101 system were also started.

During the coolant leaks to Cascade from K-301-1, cell 6 12/3/48 so much coolant escaped that K-101 had to be started. The old "W" pump was reinstalled and ran onstream from 10:15 a.m. 12/5 to 1:45 a.m. 12/6 when it had to be shutdown due to bellows failure. Another "W" pump, now used by Barrier Research will be installed in K-101 and the old K-101 "W" pump will go to Barrier Research after the overhaul job.

Motors were installed on the K-27 booster pump recycle valves according to the original plan of the K-25 - K-27 Series Operation.

Inside row coolant tubes were plugged in all converters of K-309-3 cells 5 and 6. The induction heaters are removing coolant from the heads so well now that less than a pint of liquid coolant remained when the heads were removed.

Friday, while cell 6 in K-309-3 was offstream for coolant tube plugging a test was run to see how low the pressure could be pulled using control valves and pumps in cell 4 to complete the evacuation of cell 6. It was found that by successively opening and closing five control valves in cell 4, the pressure in cell 6 came down to .015 psia in about 15 minutes.

A nipple and hose valve were installed on the feed manifold to the B-sparg at K-309-1 so that samples of material from K-101 stored in the B-sparg may be sampled for inventories. The old method of pulling samples from the valve bonnet was too slow and wasted too much P.G.

Transformers 2-V3A was removed on 11/30/48 and 2-V5A was removed on 12/6/48 for core and yoke bolt insulation.

#### AREA III - M. P. Seyfried

Cell onstream efficiency for the week was 99.87%. High sensitivity racks in this area experienced 88.81% onstream time. Low sensitivity racks 98.12% and the one metal tube rack in this area was onstream 87.95% of the time.

Cell 8, in K-301-4 was offstream nine hours and forty-five minutes to plug inside row of coolant tubes. This completes all cells of size No. 1 equipment in this area.

Cell 10, K-303-1 was offstream eight hours and ten minutes to change the 6B seal.

Cold traps were operated 112 hours during the week. Two hundred and two pounds of PG were returned to the cascade, of this amount 158 pounds were returned to K-27.

CO<sub>2</sub> consumption in the Refrigeration Room averaged eighty-six pounds per day for the week.

Operating personnel required to enter cell enclosures were checked for Alpha contamination on emerging from the cell, no evidence of Alpha contamination was discovered.

All manual valves on the coolant coolers were set to maintain a maximum of 4°F. drop in coolant-in temperature.

AREA IV - L. L. Anthony

This area experienced 100% cell onstream efficiency for the week. Line Recorder efficiency - glass racks 95.68% - metal racks 96.53%.

Due to loss of boiler No. 1 at the Power House the variable frequency for this area was lowered from 65 to 62 cps. and then to 60 cps., beginning at 0420 on 12/1/48. By 0537 on 12/3/48 the frequency had been returned to normal. There was no offstream time resulting from this power disturbance, the only trouble being encountered was that of a large amount of G-74 (four cells) accumulating at the top of K-303-10 when the K-304 Section was down. Some of this G-74 was dumped to the purge system, while the rest was bled up stream.

On 12/2/48 a test was run in K-303-8.3 with the Instrument Department and Process Engineering to determine the usefulness of the new G.E. Halogen Detector for finding leaks in the SF system. Approximately one ounce of coolant was introduced in the system, to be used as the indicating gas. The results of this test indicated that this method was impractical due to extremely low sensitivity. The Instrument Department is now looking for a gas which can be introduced into the system at a high concentration and pressure for use as the indicating gas. This gas must not be toxic, and must not affect the seals or react with P.G.

Preparations were made to run a test to determine the effect on inleakage to the cascade of lowering seal feed and seal exhaust pressures to slightly above B-pump suction pressures. The test being performed in cooperation with Process Engineering, will cover all nine buildings in this area and will last for approximately eight hours.

All line recorder stations were checked for Alpha contamination following the "T" and "X" Inventory. Two sampling manifolds were found to be contaminated and are being decontaminated. The weighing table in the area office was contaminated by a leaking Hoke tube valve, but this has been cleaned up.

AREA VI - K. M. Jones

This area experienced 100% cell onstream efficiency for the week. Line Recorder efficiency - glass racks 97.80% and metal racks 98.80%.

Experiments are continuing with the cascade splitters. It is planned to operate the TC cell across the 1A pump in K-306-1, cell 3 in order to reduce the time lag encountered by the present operation across the 6A pump.

AREA VII - J. O. Deming

This area experienced 100% cell onstream efficiency for the week. Line Recorder efficiency - glass racks 72.75% and metal racks 97.16%.

Line recorder station in K-306-7 is still being prepared for installation of the metal tube rack.

Two-cell coolant system were tied in, on 10 cells in K-306-7 and 6 cells in K-306-6.

K-312-1 operated all week as top purge, the average tops concentration was 0.000019 mol percent. K-312-2 operated as side purge during the week, the average tops concentration was 0.000014. Total purging was 32,616 standard cubic feet, daily average was 4,659 standard cubic feet.

Both K-312-1 and K-312-2 were down about thirty minutes on 12/1/48 due to a power failure.

No 2144 was used during the week. The supply for 2144 is exhausted and none will be available until some is processed in K-1303.

ELECTRICAL SYSTEM OPERATION - C. E. Jones

Transformers 2-V3A-245, 2-V6B-246 and 2-V5A-245 (K-310 Section) were removed from service for replacement of core and yoke bolt insulation. Transformers 2-V3A-245 and 2-V6B-246 were replaced with spare transformers. Transformer 2-V5A-245 is now being disconnected and will be replaced with a spare transformer. In order to remove the above transformers from service pressures were reduced from 3.0 psia to 2.8 psia in cells 3, 4, 5 and 6 of building K-310-1 and K-310-2. Cells 5 and 6 were effected at two different times due to transformers 2-V5A and 2-V6B being in the same network.

To date, ninety-four (94) 500 KVA transformers (includes all in the K-303 Section), fifty-seven (57) 600 KVA transformers (includes all in the K-309 - K-301 Sections which supply the "B" motors), and thirty (30) 800 KVA transformers have been completed. Work is in progress on three (3) 800 KVA transformers in the Electrical Shop which are being used as spares for replacement of this size transformer. The program is 80.4% complete.

Feeders 282, 284, 285, 286, 308, 317 and 319 were out of service during the report period due to a power failure noted as follows: Feeders 282, 284, 285 and 286 which supply the K-304 Section from bus No. 2 at the K-25 Switch House were de-energized due to a power failure on bus No. 2. At the time of the failure bus No. 2 was being supplied power from TVA through the CF bus "D" tie cable.

The "D" tie cable failure was caused when the disconnect switch was opened under load, resulting in a phase-to-ground fault on all three phases, which caused a total loss of power to the K-304 Section variable frequency. When the above operation occurred, this caused a heavy voltage sag on the CF bus. Voltage dropped momentarily from 14 KV to 6.2 KV on the CF bus which caused the following:

- (1) Feeder 308 which normally supplies the 13,8 KV overhead line No.1 tripped by neutral overcurrent relay action. This feeder was restored to service shortly and no damage done.
- (2) Feeder 319 (overhead) to X-10 tripped by neutral overcurrent relay action and was also restored to service a few minutes afterwards with no damage.
- (3) Feeder 317 one of the Process Area underground feeders tripped out at the Switch House by neutral ground and phase to phase (A-C) relay action. This feeder tripped out due to a failure on "C" phase at the pothead of transformer 19-C3-317. The insulation and bushing were blown off by the surge on "C" phase and arced over to "A" phase, also damaging the leg on "B" and "C" phases in the pothead of transformer 19-C3 the insulators and flexible jumpers on all three phases were replaced. After completion of repairs a dielectric absorption test was made on the feeder cable and the feeder restored to service.

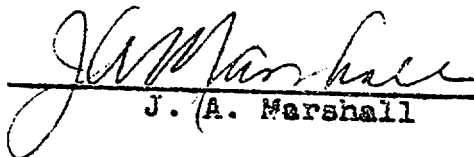
The survey of ground rod currents taken during the month of November indicated that the current has fallen too low in some of the vaults. This is partly due to the fact that some of the rods are badly corroded and do not carry much current. Electrical Maintenance Test Department in the near future will increase the current flow by changing the auto transformer taps in the rectifier sets in the vaults.



<u>DATE</u>	<u>TIME</u>	<u>VF-K-25</u>	<u>HF-K-25</u>	<u>CF-K-25</u>	<u>CF-K-27</u>
11/30/48	0700				
12/1/48	0700				
12/2/48	0700				
12/3/48	0700				
12/4/48	0700				
12/5/48	0700				
12/6/48	0700				

Average Load

NOTE: Power loads on the VF were below normal for December 1, 2 and 3 due to some sections operating at reduced frequency, on account of boiler No. 1 being out of service to repair the superheater. Also some reduction of frequency was due to trouble in the coal feed system of boiler No. 2 while boiler No. 1 was being removed from service.

  
J. A. Marshall

JAM/mjw

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